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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/498,305	02/04/2000	Burt D. Ensley	2001605-0007	8631

7590 05/01/2003

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EXAMINER

MOORE, WILLIAM W

ART UNIT PAPER NUMBER

1652

DATE MAILED: 05/01/2003

17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/498,305

Applicant(s)

ENSLEY, BURT D.

Examiner

William W. Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,9-14 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,9-14 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Response to Amendment

Applicant's Amendment C, Paper No. 16 filed February 12, 2003, has been entered, amending claims 1 and 13. The amendments permit claims 1, 2, 5, 11-14 and 17 to avoid the rejection of record under 35 U.S.C. §102 based solely on the disclosure of Weiss et al., of record. Applicant's arguments accompanying the amendments prompt the following, new, ground of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 5, 11-14 and 17 are rejected under 35 U.S.C. §103(a) as obvious over Bedell-Hogan et al., 1993, *The Journal of Biological Chemistry*, Vol. 268, No. 14, pages 10345-10350, made of record herewith, in view of Weiss, U.S. Patent 6,277,622, of record, and Rothstein et al., U.S. Patent 6,489,446, made of record herewith.

Applicant's arguments filed February 12, 2003, have been fully considered but they are moot in view of the new ground of rejection. Applicant urges in Paper No. 16 that the tropoelastin intended for use in claimed methods is virgin, recombinant, tropoelastin, thus is not the tropoelastin envisaged by Weiss. Bedell-Hogan et al. teach, see Figures 1-5, that recombinantly-produced tropoelastin which is not cross-linked is rapidly, efficiently, polymerized by purified lysyl oxidase and to a much greater extent than non-recombinant tropoelastin purified from native sources, see Figure 1 at page 10346. Bedell-Hogan et al. do not completely anticipate the claimed subject matter where they do not propose that their *in vitro* success should be applied *in vivo* in treating wounds. Weiss teaches, col. 13, lines 51-56, that "an expression product of the invention", lysyl oxidase, "may be included in a matrix including [a] . . . tropoelastin . . . which is . . . applied to the

wound." Weiss thus teaches that the enzyme and its substrate are simultaneously applied to a wound and that the enzyme is separate from the substrate prior to addition thereto where such addition of the enzyme would be superfluous if the tropoelastin were already cross-linked. Weiss further teaches, col. 13, lines 57-59, that the enzyme "can be
5 formulated in suitable carriers, buffers and other conventional delivery systems", anticipating methods of claims 11-14 and 17. Weiss also discloses, see col. 6, lines 52-61, that there are a variety of mammalian and avian lysyl oxidases, and that the preferred lysyl oxidase for application to a person is the human enzyme, anticipating claim 2. In addition, Weiss contemplates, col. 13, lines 33-35, the use of the enzyme with a variety
10 of forms of tropoelastin, anticipating claim 5. Rothstein et al., available as prior art in view of their earlier effective filing date, addresses the scope of the claim term "substantially-identical to wild-type tropoelastin", teach that human tropoelastin variant polypeptides available for cross-linking by lysyl oxidase may be used, e.g., claim 10, in treating wounds.

It would have been obvious to one of ordinary skill in the art at the time the invention
15 was made to use the recombinant, uncross-linked, tropoelastin of Bedell-Hogan et al. in the methods of Weiss because such an artisan at that time would have reasonably considered that the uncross-linked tropoelastin of Bedell-Hogan et al. would be advantageous in such applications because it can achieve a much higher degree of cross-linking due to the action of lysyl oxidase as demonstrated by Bedell-Hogan et al., Figure 1, and because Weiss
20 teaches that simultaneous administration of both the enzyme and its tropoelastin substrate, and a variety of forms, thereof, to a wound would promote healing and that the enzyme and substrate should be separated from one another so the process of cross-linking would commence with the application to the wound. Such an artisan would have considered the further teachings of Weiss to indicate the application of species-mapped tropoelastin and
25 the use of mixtures of carriers and kits of claims 12-14 and the application device of claim 11 herein. It would further have been obvious to one of ordinary skill in the art at the

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time the invention was made to use the recombinantly-produced, uncross-linked, human tropoelastin variants "substantially-identical to wild-type tropoelastin" of Rothstein et al. in methods and kits of claims 1, 2, 5, 11-14 and 17 herein in view of the clear teaching of Rothstein et al. to do so.

- 5 Claim 9 is rejected under 35 U.S.C. §103(a) as obvious over Bedell-Hogan et al., Weiss, and Rothstein et al. as applied to claims 1, 2, 5, 11-14 and 17 above, and further in view of Kagan.

10 The teachings of Bedell-Hogan et al., Weiss, and Rothstein et al., discussed above, are taken as before. Kagan teaches, pp. 380-385, that fluctuations in components of the diet can influence native lysyl oxidase activity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to repeatedly apply lysyl oxidase, and its copper ion cofactor not excluded by the method of claim 1, after a simultaneous application of lysyl oxidase and the recombinant, uncross-linked, tropoelastin taught by Bedell-Hogan et al., where both were previously kept separate, as taught by Weiss, because
15 such an artisan would have readily recognized that the enzyme applied at any particular time to the wound, including the initial application, may suffer a loss of activity at the wound site where a decrease in the levels of copper ion in the body, hence at the site of the wound, or an increase in levels of ascorbic acid in the body, hence at the site of the wound, would reduce the activity of the previously applied enzyme, requiring its
20 replenishment.

Claim 10 is rejected under 35 U.S.C. §103(a) as obvious over Bedell-Hogan et al., Weiss, and Rothstein et al., as applied to claims 1, 2, 5, 11-14 and 17 above, and further in view of Khadem et al.

25 The teachings of Bedell-Hogan et al., Weiss, and Rothstein et al., discussed above, are taken as before. Khadem et al. teaches the use of tissue glue to approximate separated wound tissues as well as application of healing molecules. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use sutures, staples, adhesive strips, or tissue glue, the latter taught by Khadem et al., to approximate separated wound tissues with mechanical means according to Khadem et al. and to simultaneously

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apply as taught by Weiss, lysyl oxidase and the recombinant, uncross-linked, tropoelastin taught by Bedell-Hogan et al., where both are kept separate prior to application because such an artisan would have readily recognized that approximation of wound tissue during the application of healing molecules would reduce the formation of scar tissue.

5


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William W. Moore whose telephone number is 703.308.0583. The examiner can normally be reached between 9:00AM-5:30PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy can be reached at 703.308.3804. The fax phone numbers for the organization where this application or proceeding is assigned are 703.308.4242 for regular communications and 703.308.0294 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0196.

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William W. Moore
April 24, 2003


PONNATHAPURA ACHUTAMURTHY
SUPERVISOR/REGISTRATION EXAMINER
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